

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A window hinge for pivotally connecting a window having a window sash to a window frame, said window hinge comprising:
 - an elongated track defining a track longitudinal axis; said track having
 - a track base wall attachable to said window frame; said track base wall having a base wall first surface for contacting said window frame and an opposed base wall second surface, said track base wall defining a base wall first end, a longitudinally opposed base wall second end, a longitudinally extending base wall first longitudinal edge and an opposed base wall second longitudinal edge;
 - a track flange extending from at least a portion of said base wall first longitudinal edge substantially perpendicularly relative to said base wall second surface, said track flange defining a flange retaining section;
 - a track attachment means for attaching said track to said window frame;
 - an elongated sash arm attachable to said window sash, said sash arm defining a sash arm longitudinal axis, a sash arm first end and a longitudinally opposed sash arm second end;
 - a sash arm attachment means for attaching said sash arm to said window sash;

- a carriage component, said carriage component being pivotally attached to said sash arm adjacent said sash arm first end, said carriage component being also mounted on said base wall second surface in a carriage operational configuration for slidable movement along said track longitudinal axis between an open window position and a closed window position while being guided by said track flange and retained by said flange retaining section;

- a support arm for pivotally linking said sash arm and said track, said support arm defining a support arm first end and a longitudinally opposed support arm second end, said support arm adjacent said support arm first end being pivotally attached to said sash arm intermediate said sash arm first and second ends and said support arm adjacent said support arm second end being pivotally attached to said track base wall adjacent said base wall first end;

- a securing means other than said flange retaining section extending between said track base wall and said carriage component for maintaining said carriage component in said carriage operational configuration; whereby said securing means prevents said carriage component from being separated from said flange retaining section when pressure is exerted on said window.

2. A window hinge as recited in claim 1 wherein said carriage component is provided with a retaining slot formed therein, said retaining slot being configured, sized and positioned to slidably receive said flange retaining section.

3. A window hinge s recited in claim 2 wherein said carriage component defines a carriage first main surface and a substantially opposed carriage second main surface, said retaining slot being formed in said carriage first main surface; whereby said flange retaining section slides within said retaining slot when said carriage second main surface slides on said base wall second surface.

4. A window hinge as recited in claim 3 wherein said track flange includes a flange spacing segment extending from said track base wall, said flange spacing segment defining a spacing segment distal edge positioned away from said track base wall, said flange retaining section extending from said spacing segment distal edge.

5. A window hinge as recited in claim 4 wherein said flange retaining section has a substantially "L"-shaped configuration; said flange retaining section including a retaining section first arm extending substantially perpendicularly from said flange spacing segment in an overlying relationship with said base wall second surface and a retaining section second arm extending substantially perpendicularly from said retaining section first arm in a substantially parallel and spaced relationship with said flange spacing segment; said retaining section second arm being inserted in said retaining slot.

6. A window hinge as recited in claim 1 wherein said securing means includes

- a securing recess formed in said carriage first main surface, said securing recess allowing said carriage component to slide between said open and closed window positions; and

- a securing protrusion protruding from said base wall second surface, said securing protrusion being configured, sized and positioned so as to be inserted in said securing recess when said carriage component is in said closed window position and so as to cooperate with said securing recess for maintaining said carriage component in said operational configuration; whereby said securing protrusion is adapted to abuttingly contact an inner surface of said securing recess for preventing said carriage component from being separated from said track when pressure is exerted on said window.

7. A window hinge as recited in claim 6 wherein said securing protrusion includes a punched-up portion of said track base wall.

8. A window hinge as recited in claim 6 wherein said securing protrusion has substantially the configuration of a cupola truncated in half.

9. A window hinge as recited in claim 5 wherein said securing means includes

- a securing recess formed in said carriage first main surface, said securing recess allowing said carriage component to slide between said open and closed window positions; and

- a securing protrusion protruding from said base wall second surface, said securing protrusion being configured, sized and positioned so as to be inserted in said securing recess when said carriage component is in said closed window position and so as to cooperate with said securing recess for maintaining said retaining section second arm inserted in said retaining slot; whereby said securing protrusion is adapted to abuttingly contact an inner surface of said securing recess for preventing said carriage component from being separated from said track when pressure is exerted on said window.

10. A window hinge as recited in claim 1 wherein said securing means includes a securing flange extending opposite said track flange substantially adjacent to said carriage component.

11. A window hinge as recited in claim 10 wherein said securing flange extends from at least a portion of said base wall second longitudinal edge substantially perpendicularly relative to said base wall second surface.

12. A window hinge as recited in claim 11 wherein said securing flange includes a securing flange first segment extending from at least a portion of said base wall second longitudinal edge substantially perpendicularly relative to said base wall second surface and a securing flange second segment extending substantially perpendicularly from said securing flange first segment in an overlying relationship with said base wall second surface towards said track flange.

13. A window hinge as recited in claim 10 further comprising an elongated securing component positioned adjacent said track in a substantially parallel relationship with the latter, said securing component including a securing component base wall extending in a substantially coplanar relationship with said track base wall, said securing flange extending substantially perpendicularly from said securing component base wall.

14. A window hinge as recited in claim 5 wherein said carriage component also includes a first and a second carriage component auxiliary surfaces both extending between said carriage component first and second main surfaces, said carriage component first auxiliary surface being in a substantially proximal relationship with said flange spacing segment; said securing means includes a securing flange extending opposite said track flange substantially adjacent to said carriage second auxiliary surface.

15. A window hinge as recited in claim 1 wherein said support arm is pivotally attached to said track base wall by a support-to-base wall pivotal connection allowing adjustment of the longitudinal position of a pivotal axis thereof along the track longitudinal axis.

16. A window hinge as recited in claim 1 wherein said support arm is pivotally attached to said track base wall by a support-to-base wall pivotal connection, said support-to-base wall pivotal connection including a pivotal connection

aperture formed in said support arm substantially adjacent to said support arm second end; said support-to-base wall pivotal connection also including a mounting clip, said mounting clip having a clip base defining a clip base first surface and a clip base second surface; said clip base first surface having a substantially centrally positioned base recess formed therein; said mounting clip also having at least two clip prongs extending said clip base second surface, each of said clip prongs being provided with a prong retaining lip extending substantially outwardly therefrom; said clip prongs being insertable within said pivotal connection aperture; said clip prongs being movable between a locking configuration wherein said clip prongs are in a relatively spaced relationship relative to each other with said prong retaining lips preventing retraction of said clip prongs from said pivotal connection and an unlocked configuration wherein said clip prongs are in a relatively proximal relationship relative to each other so as to allow retraction thereof from said pivotal connection aperture; said support-to-base wall pivotal connection further including a clip-to-track attachment means for attaching said mounting clip to said track.

17. A window hinge as recite in claim 16 wherein said clip-to-track attachment means includes an attachment pin extending between said clip base and said track.

18. A window hinge as recited in claim 17 wherein said attachment pin is offset relative to the center of said clip base so that rotation of said clip base relative to said track will change the longitudinal position of a pivotal axis of the support-to-base wall pivotal connection along the track longitudinal axis.

19. A window hinge as recited in claim 18 further comprising a base seat extending from said base wall second surface for receiving said clip base and allowing selective rotation thereof.

20. A window hinge for pivotally connecting a window having a window sash to a window frame, said window hinge comprising:

- an elongated track defining a track longitudinal axis; said track having
 - a track base wall attachable to said window frame; said track base wall having a base wall first surface for contacting said window frame and an opposed base wall second surface, said track base wall defining a base wall first end, a longitudinally opposed base wall second end, a longitudinally extending base wall first longitudinal edge and an opposed base wall second longitudinal edge;
 - a track flange extending from at least a portion of said base wall first longitudinal edge substantially perpendicularly relative to said base wall second surface, said track flange defining a flange retaining section;
 - a track attachment means for attaching said track to said window frame;
 - an elongated sash arm attachable to said window sash, said sash arm

defining a sash arm longitudinal axis, a sash arm first end and a longitudinally opposed sash arm second end;

- a sash arm attachment means for attaching said sash arm to said window sash;

- a carriage component, said carriage component being pivotally attached to said sash arm adjacent said sash arm first end, said carriage component being also mounted on said base wall second surface in a carriage operational configuration for slidable movement along said track longitudinal axis between an open window position and a closed window position while being guided by said track flange and retained by said flange retaining section;

- a support arm for pivotally linking said sash arm and said track, said support arm defining a support arm first end and a longitudinally opposed support arm second end, said support arm adjacent said support arm first end being pivotally attached to said sash arm intermediate said sash arm first and second ends and said support arm adjacent said support arm second end being pivotally attached to said track base wall adjacent said base wall first end;

- said support arm being pivotally attached to said track base wall by a support-to-base wall pivotal connection allowing adjustment of the longitudinal position of a pivotal axis thereof along the track longitudinal axis.

21. A window hinge as recited in claim 20 wherein, said support-to-base wall pivotal connection includes a pivotal connection aperture formed in said support arm substantially adjacent to said support arm second end; said support-to-base

wall pivotal connection also including a mounting clip, said mounting clip having a clip base defining a clip base first surface and a clip base second surface; said clip base first surface having a substantially centrally positioned base recess formed therein; said mounting clip also having at least two clip prongs extending said clip base second surface, each of said clip prongs being provided with a prong retaining lip extending substantially outwardly therefrom; said clip prongs being insertable within said pivotal connection aperture; said clip prongs being movable between a locking configuration wherein said clip prongs are in a relatively spaced relationship relative to each other with said prong retaining lips preventing retraction of said clip prongs from said pivotal connection and an unlocked configuration wherein said clip prongs are in a relatively proximal relationship relative to each other so as to allow retraction thereof from said pivotal connection aperture; said support-to-base wall pivotal connection further including a clip-to-track attachment means for attaching said mounting clip to said track.

22. A window hinge as recite in claim 21 wherein said clip-to-track attachment means includes an attachment pin extending between said clip base and said track.

23. A window hinge as recited in claim 22 wherein said attachment pin is offset relative to the center of said clip base so that rotation of said clip base relative to said track will change the longitudinal position of a pivotal axis of the

support-to-base wall pivotal connection along the track longitudinal axis.

24. A window hinge as recited in claim 23 further comprising a base seat extending from said base wall second surface for receiving said clip base and allowing selective rotation thereof.